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CATEGORY:

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TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35.U.S.C. 371

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U S APPLICATION NO
09/674908

INTERNATIONAL APPLICATION NO	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/JP99/02333	27 APRIL 1999	12 MAY 1998

TITLE OF INVENTION
FILM FOR FORMING VAPOR DEPOSITED BALLOON

APPLICANT(S) FOR DO/EO/US
Osamu Niwa, Hidekazu Biwaki and Takahiro Oka

Applicant herewith submits to the United States Designated /Elected Office (DO/EO/US) the following items and other information:

1. [x] This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. [x] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(I).
4. [ ] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. [ ] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [ ] is transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] has been transmitted by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [x] A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. [ ] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] have been transmitted by the International Bureau
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [ ] have not been made and will not be made.
8. [ ] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. [x] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. [ ] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [x] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [ ] A FIRST preliminary amendment.
    [ ] A SECOND or SUBSEQUENT preliminary amendment.
14. [ ] A substitute specification.
15. [ ] A change of power of attorney and/or address letter.
16. [x] Other items or information:

Verification of Translation
English translation (13 pages spec, 1 page claims, 1 page abstract)
PCT Request
International Search Report
First page of WO99/58216 Publication
PCT/IB/308
Recordation Cover Sheet for Assignment

INTERNATIONAL APPLICATION NO. PCT/IB99/02353	INTERNATIONAL FILING DATE 27 APRIL 1999	PRIORITY DATE CLAIMED 12 MAY 1998

17. [X] The following fees are submitted:

Basic National Fee (37 CFR 1.492(a)(1)-(5):

Neither international preliminary examination fee (37 CFR 1.482)

Nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO (1.492(a)(3)) $1,000.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO (1.492(a)(5) $860.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO(1.492(a)(2)) $710.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) (1.492(a)(1)) $690.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) ..... $ 100.00

CALCULATIONS PTO USE ONLY

ENTER APPROPRIATE BASIC FEE AMOUNT =	$860.00	
Surcharge of $130.00 for furnishing the oath or declaration later than [ ] **20** [ ] **30** months from the earliest claimed priority date (37 C.F.R. 1.492)(e)).	$	

Claims	**Number Filed**	**Number Extra**	**Rate**	$	
Total Claims	6 -20=		X $ 18.00	$	
Independent Claims	1 -3=		X $ 80.00	$	
Multiple dependent claim(s) (if applicable)			+ $270.00	$	
			TOTAL OF ABOVE CALCULATIONS =	$860.00	
Reduction by ½ for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).				$	
			SUBTOTAL =	$860.00	
Processing fee of $130.00 for furnishing the English translation later than [ ] **20** [ ] **30** months from the earliest claimed priority date (37 CFR 1.492(f)).			+	$	
			TOTAL NATIONAL FEE =	$860.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property			+	$ 40.00	
			TOTAL FEES ENCLOSED =	$900.00	
				Amt. refunded	$
				charged	$

a. [X] A check in the amount of $ 860 & 40 to cover the above fees is enclosed.

b. [ ] Please charge our Deposit Account No. 02-4377 in amount of $___ to cover the above fees. A copy of this sheet is enclosed.

c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-4377. A copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

BAKER BOTTS L.L.P.
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New York, New York 10112-4498

Signature Ronald B. Hildreth

November 7, 2000
Date

19,498
Registration No.

DESCRIPTION

FILM FOR FORMING VAPOR DEPOSITED BALLOON

TECHNICAL FIELD

The present invention relates to a film for forming a vapor deposited balloon and a method for manufacturing the same.

BACKGROUND ART

Conventionally used as a film for forming a vapor deposited balloon is a laminate film having a three-layer structure consisting of a layer of nylon 6, an adhesive resin layer and a layer of LLDPE.

Further, Japanese Unexamined Patent Publication No. 290650/1995 proposes a laminate film having a five-layer structure consisting of a polyamide resin layer, a saponified copolymer layer of ethylene and vinyl acetate, a polyamide resin layer, an adhesive resin layer and a polyolefin resin layer.

These films, however, have the defect of curling.

An object of the present invention is to provide a film for forming a vapor deposited balloon, which is free of curling.

DISCLOSURE OF INVENTION

The present invention provides a film for forming a vapor deposited balloon, the film having a five-layer structure consisting of a polyamide resin layer, a

polyolefin layer, a polyamide resin layer, an adhesive resin layer and an LLDPE layer.

In the film for forming a vapor deposited balloon according to the invention, the polyamide resin layer comprises crystalline or amorphous nylon such as nylon 6 (poly-ε-caprolactam), nylon 66 (polyhexamethylene adipamide), nylon 12 (a polymer of lactam of 12-aminododecanoic acid), nylon 6-66 copolymer, nylon 6-12 copolymer or the like. The polyamide resin layer preferably comprises about 70-95 wt.% of crystalline nylon and about 30-5 wt.% of amorphous nylon, more preferably about 80-90 wt.% of crystalline nylon and about 20-10 wt.% of amorphous nylon. Nylon 6-66 copolymer is a copolymer of nylon 6 (poly-ε-caprolactam) and nylon 66 (polyhexamethylene adipamide), and preferably contains nylon 6 in a proportion of about 30 mole % or more, more preferably about 50 mole % or more, further more preferably about 70 mole % or more. The nylon copolymer preferably has a molecular weight of about 13,000 to about 33,000. The two polyamide resin layers of the film may be the same or different as long as they contain the above components. Each polyamide resin layer has a thickness of about 1-15 μm, preferably about 3-10 μm. Examples of amorphous nylons include copolymers or terpolymers of dicarboxylic acid (e.g., terephthalic acid and isophthalic

acid) and diamine (e.g., hexamethylenediamine).

Any polyolefin layer that is capable of bonding the two polyamide resin layers together can be used without limitation. The polyolefin layer preferably comprises polyolefin such as polyethylene or polypropylene, more preferably linear low density polyethylene (LLDPE) and/or low density polyethylene (LDPE), especially LLDPE. The polyolefin layer has a thickness of about 1-6 μm, preferably about 1.5-4 μm. The polyolefin layer may contain, in addition to or in place of polyolefin such as LLDPE, a polyolefin-based adhesive resin such as grafted LLDPE. The polyolefin layer preferably comprises a polyolefin-based adhesive resin.

Any adhesive resin layer that is capable of bonding the polyamide resin layer and the seal layer together may be used without limitation. A preferred adhesive resin is LLDPE treated by graft reaction. The adhesive resin layer has a thickness of about 1-6 μm, preferably about 1.5-3 μm.

The seal layer comprises LLDPE or LDPE, especially LLDPE. The seal layer has a thickness of about 2-20 μm, preferably about 5-10 μm.

The total thickness of the layers of the film for forming a balloon according to the invention is about 10-70 μm, preferably about 15-35 μm.

Preferably, the polyamide shrinkable multilayer film of the invention is a flat film. The layers of the film are co-extruded from a T-die into a flat film and the film is subjected to simultaneous or sequential biaxial stretching. The laminate film may be formed by any method without limitation, but generally formed by extrusion casting on a chilled roll. The film thus obtained is simultaneously or sequentially stretched in biaxial directions, thereby giving a film of the invention. The stretching may be carried out in the machine direction using a roll stretching machine and in the transverse direction using a tenter stretching machine.

The stretch ratio in machine direction is about 1.2-5 and the stretch ratio in transverse direction is about 2.5-5. Stretching in machine direction is carried out at about 60-120℃, preferably about 70-100℃. Stretching in transverse direction is carried out at about 70-180℃, preferably about 100-160℃.

After stretching, heat treatment may optionally be carried out. There is no limitation on the heat treatment method, but the heat treatment is generally carried out by a continuous process after transverse stretching using a tenter stretching machine. The heat treatment may be carried out with the film being diminished (relaxed) in width by 20% or less, preferably

by 3-10%, or with the film being set to the same width as when transversely stretched or set to a larger width than when transversely stretched. The heat treatment may be carried out at temperatures below 150℃, preferably at about 80-130℃, optionally with the film being diminished in width by 20% or less, preferably by 3-10%, for example, using a tenter stretching machine. The film is subjected to thermal contraction in order to prevent natural contraction.

The multilayer film of the present invention is suitable for use as a film for forming a vapor deposited balloon. Stated more specifically, a vapor deposited layer of aluminium oxide, silicon dioxide or any other metal (e.g., aluminum foil) may be formed over the whole or partial surface of the outermost polyamide resin layer of the film of the invention. The metal deposited layer may be formed on any part of the surface of the outermost layer. However, it is preferable that the film be cut into strips and a metal vapor deposited layer be formed on one side of the centerline in width, with the other side being a transparent film. This is convenient because with use of such a film, one can very easily form a balloon having a transparent half side and a non-transparent metal deposited layer formed on the other half side. Moreover, by using the film, one can easily form a spherical balloon

having a transparent appearance in one hemisphere and a non-transparent metal deposited layer formed on the other hemisphere.

Preferably, the balloon film of the present invention has the following physical properties:

- Haze (measured according to ASTM D-1003): 1.0-7.0%, preferably 2.0-5.0%;
- Tensile strength: MD (800-1500 kg/cm^2), TD (800-1500 kg/cm^2);
- Tensile elongation: MD (80-180%), TD (80-180%); (tensile strength and tensile elongation both measured according to JIS K-6732);
- Thermal shrinkage (measured in warm water at 100℃ for 30 seconds): MD (0-5.0%), TD (0-5.0%);
- Puncture strength: NY surface (0.5 kg or more); LL surface (0.5 kg or more) (measured according to JIS P-8116);
- Impact strength: NY surface (5.0 kg·cm or more); LL surface (5.0 kg·cm or more) (measured with a punching impact tester using a small ball);
- Seal strength (pressure = $2kg/cm^2$; time = 1 second): 120℃ (1.0 kg/cm or more), 130℃ (1.0 kg/cm or more), 140℃ (1.5 kg/cm or more), 150℃ (1.5 kg/cm or more), 160℃ (1.5 kg/cm or more), 170℃ (1.5 kg/cm or more);
- Oxygen permeability: 100 $cc/m^2 \cdot 24h \cdot 20℃ \times 65\%RH$ or less

(measured according to ASTM D-3985);

- Wet tension strength: NY surface (45 dyn/cm or more) (measured according to JIS K-6768);
- Slipperiness: between NY-NY surfaces (both the coefficient of static friction and the coefficient of dynamic friction being 0.3 to 0.6);
  between LL-LL surfaces (both the coefficient of static friction and the coefficient of dynamic friction being 0.3 to 0.8) (measured according to ASTM D-1894).

The balloon of the present invention can be formed by heat sealing portions of seal layer(s) of the balloon film(s) together to form into a desired shape such as sphere, ellipse or the like in a desired size.

BEST MODE FOR CARRYING OUT THE INVENTION

The present invention will be described below in more detail with reference to Examples and Comparative Examples.

[Curling Evaluation Method]

Measurement temperature and humidity: 20℃ and 50%RH

(1) a film, 100 mm x 100 mm, is diagonally cut to make incisions,

(2) the width and height of the film are measured after rolling up the film in the machine direction and in the transverse direction.

Criteria:

The larger the width is, the smaller curling property the film has (the quality is good).

The greater the height is, the smaller curling property the film has (the quality is good).

This is because a film having higher curling property is rolled up tightly, thus having a smaller width and a lower height.

Example 1

The laminate film having a five-layer structure was formed using the following starting materials.

(1) Starting materials:

- Polyamide resin layer (hereinafter referred to as layer "A") = nylon 6 (80 wt.%) and amorphous nylon (20 wt.%).
- Polyolefin layer (hereinafter referred to as layer "B") = an LLDPE based adhesive resin
- Adhesive resin layer (hereinafter referred to as layer "C") = an LLDPE based adhesive resin
- Seal layer (hereinafter referred to as layer "D") = LLDPE

(2) Production method

The layer components (A/B/A/C/D) were coextruded from a T-die to form a flat five-layer film on a chilled roll with cooling water being circulated. The film was then stretched three times in the machine direction using

a roll stretching machine at 80℃ and stretched 3.8 times in the transverse direction using a tenter stretching machine in an atmosphere at 120°C. Subsequently, with the width of the film being reduced by about 4% using the tenter stretching machine, the film was thermally fixed in an atmosphere at 200°C. The film obtained had a thickness of A/B/A/C/D = 4/2/4/2/8 (μm).

Table 1 shows physical properties of the film.

Example 2

A laminate film having a five-layer structure consisting of A/B/A/C/D = 4/2/4/2/8 (μm) in thickness was formed in the same manner as in Example 1 except that the following starting materials were used. Table 1 shows physical properties of the film.

Layer A = nylon 6 (80 wt.%) and amorphous nylon (20 wt.%)

Layer B = LLDPE based adhesive resin (50 wt.%) + LLDPE (50 wt.%)

Layer C = LLDPE based adhesive resin

Layer D = LLDPE

Example 3

A laminate film having a five-layer structure consisting of A/B/A/C/D = 6/3/6/2/18 (μm) in thickness was formed in the same manner as in Example 1 except that the following starting materials were used. Table 1 shows physical properties of the film.

Layer A = nylon 6 (80 wt.%) and amorphous nylon (20 wt.%)

Layer B = LLDPE based adhesive resin

Layer C = LLDPE based adhesive resin

Layer D = LLDPE

Physical properties of the films obtained in Examples 1-3 were determined according to the following methods:

- Haze: measured according to ASTM D-1003;
- Tensile strength and tensile elongation: measured according to JIS K-6732;
- Slipperiness (static friction/dynamic friction): measured according to ASTM D-1894;
- Thermal shrinkage: measured in warm water at 100℃ for 30 seconds;
- Puncture strength: measured according to JIS P-8116;
- Impact strength: measured with a punching impact tester using a small ball;
- Seal strength: measured at a pressure of 2kg/cm^2 for 1 second;
- Oxygen permeability: measured according to ASTM D-3985;
- Wet tension strength: measured according to JIS K-6768;

Table 1

	Example 1	Example 2	Example 3
Average thickness (μm):	20.7	20.5	35.0
Haze (%):	2.5	3.2	6.5
Tensile strength (kg/cm^2)			
MD	960	854	819
TD	1397	1260	1140
Tensile elongation (%)			
MD	160	154	150
TD	85	95	92
Slipperiness (static friction/dynamic friction)			
NY-NY	0.58/0.51	0.49/0.42	0.46/0.38
LL-LL	0.62/0.51	0.50/0.42	0.40/0.36
Thermal shrinkage (%)			
MD	2.3	1.8	1.4
TD	1.3	0.8	0.5
Puncture strength (kg)			
NY surface	0.67	0.72	0.95
LL surface	0.60	0.62	0.75
Impact strength (kg·cm)			
NY surface	8.3	9.0	9.8
LL surface	9.0	9.5	10.8

Table 1 (continued)

	Example 1	Example 2	Example 3
Seal strength (kg/cm)			
120℃	1. 2	1. 2	1. 9
130℃	2. 1	2. 3	3. 4
140℃	2. 2	2. 2	3. 5
150℃	2. 3	2. 3	3. 6
160℃	2. 3	2. 3	3. 7
170℃	2. 3	2. 2	3. 7
Oxygen permeability			
($cc/m^2 \cdot 24h \cdot 20℃ \times 65\%RH$)	43	42	40
Wet tension strength (dyn/cm)			
LL surface	36	36	36
NY surface	50	50	50

Comparative Example 1

A laminate film having a three-layer structure consisting of A/C/D = 10/2/10 (μm) in thickness was formed in the same manner as in Example 1 except that the following starting materials were used. The curing of the film obtained was measured. Table 2 shows the results.

Layer A = nylon 6 (80 wt.%) and amorphous nylon (20 wt.%)

Layer C = LLDPE based adhesive resin

Layer D = LLDPE

Test Example 1

The films obtained in Example 1 and Comparative

Example 1 were tested for curling. Table 2 shows the results.

Table 2

	Width (mm)		Length (mm)	
	MD	TD	MD	TD
Example 1	8-10	7-9	10-12	15-17
Comp. Ex.1	5	5	5	5

Example 4

The film obtained in Example 1 was cut into strips having a width of 100 cm. A metal vapor deposited layer of aluminum was formed to a thickness of 400Å on one half of the surface of layer (A), i.e., on one side of the centerline in width. The obtained strips of the balloon film were formed into a spherical shape by heat sealing portions of seal layers of the strips together. By feeding therein helium gas at 1.2 atm., a balloon having a non-transparent metal deposited layer was formed. The balloon thus obtained had a good design effect and floated in the air for 7 days.

CLAIMS

1. A film for forming a vapor deposited balloon, which comprises a five-layer structure composed of a polyamide resin layer, a polyolefin layer, a polyamide resin layer, an adhesive resin layer and a seal layer.

2. The film for forming a vapor deposited balloon according to claim 1 wherein the polyamide resin layer is a mixed resin layer comprising 5 to 30 wt.% of an amorphous polyamide resin and 95 to 70 wt.% of an aliphatic polyamide resin and/or a semiaromatic polyamide resin.

3. A film for forming a vapor deposited balloon, which is produced by forming a metal deposited layer over the whole or partial surface of the outermost polyamide resin layer of the film according to claim 1.

4. A film for forming a vapor deposited balloon, which has a transparent appearance on one side and comprises a metal deposited layer formed on the other side.

5. A balloon comprising the film for forming a vapor deposited balloon according to claim 1.

6. A method for producing a vapor deposited balloon, which comprises heat sealing portions of the seal layer(s) of vapor deposited balloon film(s) of claim 1 together to form into a desired shape such as sphere, ellipse or the like in a desired size.

Abstract

The present invention provides a film for forming a vapor deposited balloon, which comprises a five-layer structure composed of a polyamide resin layer, a polyolefin layer, a polyamide resin layer, an adhesive resin layer and a seal layer.

BAKER & BOTTS, L.L.P.
FILE NO.: RBH A 33[illegible]

COMBINED DECLARATION AND POWER OF ATTORNEY

(Original, Design, National Stage of PCT, Divisional, Continuation or C-I-P Application)

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name; I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:
FILM FOR FORMING VAPOR DEPOSITED BALLOON
This declaration is of the following type:

- [] original
- [] design
- [X] national stage of PCT.
- [] divisional
- [] continuation
- [] continuation-in-part (C-I-P)

the specification of which: *(complete (a), (b), or (c))*

(a) [ ] is attached hereto.
(b) [ ] was filed on as Application Serial No. and was amended on *(if applicable).*
(c) [X] was described and claimed in PCT International Application No. PCT/JP99/02333 filed on April 27, 1999 and was amended on *(if applicable).*

Acknowledgement of Review of Papers and Duty of Candor

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of the subject matter claimed in this application in accordance with Title 37, Code of Federal Regulations § 1.56.

[ ] In compliance with this duty there is attached an information disclosure statement. 37 CFR 1.98.

Priority Claim

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT International Application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT International Application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application on which priority is claimed

(complete (d) or (e))

(d) [ ] no such applications have been filed.
(e) [X] such applications have been filed as follows:

PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO SAID APPLICATION			
COUNTRY / APPLICATION NO.	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119
Japan 1998-128348	12/05/1998		[X] YES NO [ ]
			[ ] YES NO [ ]
			[ ] YES NO [ ]
ALL FOREIGN APPLICATION[S], IF ANY, FILED MORE THAN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO SAID APPLICATION			
			[ ] YES NO [ ]
			[ ] YES NO [ ]
			[ ] YES NO [ ]

Claim for Benefit of Prior U.S. Provisional Application(s)

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

Provisional Application Number	Filing Date

Claim for Benefit of Earlier U.S./PCT Application(s) under 35 U.S.C. 120

(complete this part only if this is a divisional, continuation or C-I-P application)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior application(s) in the manner provided by the first paragraph of Title 35, United States Code § 112, I acknowledge the duty to disclose information as defined in Title 37, Code of Federal Regulations, § 1.56 which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

(Application Serial No.) (Filing Date) (Status) (patented, pending, abandoned)

(Application Serial No.) (Filing Date) (Status) (patented, pending, abandoned)

Power of Attorney

As a named inventor, I hereby appoint Dana M. Raymond, Reg. No. 18,540; Frederick C. Carver, Reg. No. 17,021; Francis J. Hone, Reg. No. 18,662; Joseph D. Garon, Reg. No. 20,420; Arthur S. Tenser, Reg. No. 18,839; Ronald B. Hildreth, Reg. No. 19,498; Thomas R. Nesbitt, Jr., Reg. No. 22,075; Robert Neuner, Reg. No. 24,316; Richard G. Berkley, Reg. No. 25,465; Richard S. Clark, Reg. No. 26,154; Bradley B. Geist, Reg. No. 27,551; James J. Maune, Reg. No. 26,946; John D. Murnane, Reg. No. 29,836, Henry Tang, Reg. No. 29,705, Robert C. Scheinfeld, Reg. No. 31,300, John A. Fogarty, Jr., Reg. No. 22,348, Louis S. Sorell, Reg. No. 32,439 and Rochelle K. Seide Reg. No. 32,300 of the firm of BAKER & BOTTS, L.L.P., with offices at 30 Rockefeller Plaza, New York, New York 10112, as attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith

SEND CORRESPONDENCE TO:	DIRECT TELEPHONE CALLS TO:
BAKER & BOTTS, L.L.P. 30 ROCKEFELLER PLAZA, NEW YORK, N.Y. 10112 CUSTOMER NUMBER: 21003	BAKER & BOTTS, L.L.P. (212) 705-5000

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section

1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1-00 FULL NAME OF SOLE OR FIRST INVENTOR	LAST NAME: NIWA	FIRST NAME: Osamu	MIDDLE NAME:	
RESIDENCE & CITIZENSHIP	CITY: Adachi-gun	STATE or FOREIGN COUNTRY: Fukushima 969-1104, Japan	COUNTRY OF CITIZENSHIP: JPX Japan	
POST OFFICE ADDRESS	POST OFFICE ADDRESS: c/o FUKUSHIMA PLASTICS CO., LTD., 88 Aza Emukai, Oaza Arai, Motomiya-cho,	CITY: Adachi-gun	STATE or COUNTRY: Fukushima, Japan	ZIP CODE: 969-1104
DATE: Oct. 25, 2000	SIGNATURE OF INVENTOR: Osamu Niwa			
2-00 FULL NAME OF SECOND JOINT INVENTOR, IF ANY	LAST NAME: BIWAKI	FIRST NAME: Hidekazu	MIDDLE NAME:	
RESIDENCE & CITIZENSHIP	CITY: Moriyama-shi	STATE or FOREIGN COUNTRY: Shiga 524-8501, Japan	COUNTRY OF CITIZENSHIP: JPX Japan	
POST OFFICE ADDRESS	POST OFFICE ADDRESS: c/o Moriyama Plant Plastic Division of GUNZE LIMITED, 163, Morikawara-cho,	CITY: Moriyama-shi	STATE or COUNTRY: Shiga, Japan	ZIP CODE: 524-8501
DATE: Oct. 25, 2000	SIGNATURE OF INVENTOR: Hidekazu Biwaki			
3-00 FULL NAME OF THIRD JOINT INVENTOR, IF ANY	LAST NAME: OKA	FIRST NAME: Takahiro	MIDDLE NAME:	
RESIDENCE & CITIZENSHIP	CITY: Chuo-ku	STATE or FOREIGN COUNTRY: Tokyo 103-0027, Japan	COUNTRY OF CITIZENSHIP: JPX Japan	
POST OFFICE ADDRESS	POST OFFICE ADDRESS: c/o GUNZE LIMITED, GUNZE Nihonbashi Building, 10-4, Nihonbashi 2-chome,	CITY: Chuo-ku	STATE or COUNTRY: Tokyo, Japan	ZIP CODE: 103-0027
DATE: Oct. 25, 2000	SIGNATURE OF INVENTOR: Takahiro Oka			
FULL NAME OF FOURTH JOINT INVENTOR, IF ANY	LAST NAME:	FIRST NAME:	MIDDLE NAME:	
RESIDENCE & CITIZENSHIP	CITY:	STATE or FOREIGN COUNTRY:	COUNTRY OF CITIZENSHIP:	
POST OFFICE ADDRESS	POST OFFICE ADDRESS:	CITY:	STATE or COUNTRY:	ZIP CODE:
DATE	SIGNATURE OF INVENTOR:			
FULL NAME OF FIFTH JOINT INVENTOR, IF ANY	LAST NAME:	FIRST NAME:	MIDDLE NAME:	
RESIDENCE & CITIZENSHIP	CITY:	STATE or FOREIGN COUNTRY:	COUNTRY OF CITIZENSHIP:	
POST OFFICE ADDRESS	POST OFFICE ADDRESS:	CITY:	STATE or COUNTRY:	ZIP CODE:
DATE	SIGNATURE OF INVENTOR:			
FULL NAME OF SIXTH JOINT INVENTOR, IF ANY	LAST NAME:	FIRST NAME:	MIDDLE NAME:	
RESIDENCE & CITIZENSHIP	CITY:	STATE or FOREIGN COUNTRY:	COUNTRY OF CITIZENSHIP:	
POST OFFICE ADDRESS	POST OFFICE ADDRESS:	CITY:	STATE or COUNTRY:	ZIP CODE:
DATE	SIGNATURE OF INVENTOR:			